

---

Theory-Based Stress Measurement

Author(s): Richard S. Lazarus

Reviewed work(s):

Source: *Psychological Inquiry*, Vol. 1, No. 1 (1990), pp. 3-13

Published by: [Taylor & Francis, Ltd.](#)

Stable URL: <http://www.jstor.org/stable/1449700>

Accessed: 15/12/2012 14:01

---

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at  
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Taylor & Francis, Ltd. is collaborating with JSTOR to digitize, preserve and extend access to *Psychological Inquiry*.

<http://www.jstor.org>

---

## TARGET ARTICLE

---

### Theory-Based Stress Measurement

Richard S. Lazarus

University of California, Berkeley

*Although arguments about how to measure psychological stress are typically based on implicit epistemological and theoretical assumptions, stress measurement has almost never been truly theory driven. The objective of this article is to address several measurement and research issues that derive from my particular metatheoretical concepts of systems thinking, transaction, and process and from my substantive theoretical concepts, which center on appraisal and coping. These issues are illustrated with research on the Hassles Scale.*

*I address four controversial issues with reasoned arguments, and, as might be anticipated, I take the view (a) that stress is mainly a subjective rather than objective phenomenon, (b) that it is best measured as seemingly minor annoyances rather than major cataclysms, (c) that confounding—although a problem—does not account for the relationship between stress and adaptational outcomes, and (d) that any stress measure should assess the contents or sources of stress rather than merely its degree. In addition, I argue for increased emphasis on psychological content in stress scales and for greater attention to the individual's larger adaptational context, to a systems theory perspective, and to the time periods during which stress is sampled.*

*Finally, I argue that we should abandon the measurement of stress, which tends to be too unidimensional, in favor of measuring the degree and quality of the emotions of daily living. Information derived from such measures could greatly expand our understanding of how individuals handle both positive and negative experiences.*

Research on the causes of stress reactions, or on their adaptational consequences, depends on having an available measure of stress. Measurement is also essential if we are interested in pathological or pathogenic stress, or in clinical intervention for the purpose of treatment or prevention. These practical concerns as well as theoretical ones have fueled and sustained academic and clinical interest in the stress process.

I shall not attempt to provide a review of stress measures, all of which are inadequate in certain ways, including my own. The most valuable contribution I can make would be an analysis of the strategy of stress measurement in the hope of stimulating better approaches in the future.

My fundamental premise is that measurement is always best when it springs from theory. How one defines and conceptualizes stress and the contributing variables will have profound consequences for the tools of measurement we create or select. Existing measurement approaches are seldom if ever based on theory, though commonly there are unstated assumptions, which are often inadequate, about how the stress process works.

I begin, therefore, with a theoretical analysis of the stress concept from which measures of the stress process might be derived, followed by discussion of some existing measures. The theoretical analysis is one with which I have long been identified and, therefore, it should be mercifully brief.

#### Stress Theory

Psychological stress refers to a particular kind of relationship between person and environment (Lazarus, 1966; Lazarus & Folkman, 1984, 1987). The stress relationship is one in which demands tax or exceed the person's resources. The unit of analysis is an ongoing transaction or encounter, which is *appraised* by the person as involving harm, the threat of harm, or a positive, optimistic, mobilized, and eager attitude about overcoming obstacles, which I have called *challenge*. Once a person has appraised a transaction as stressful, *coping* processes are brought into play to manage the troubled person–environment relationship, and these processes influence the person's subsequent appraisal and hence the kind and intensity of the stress reaction. This cognitive-relational view, which once had to overcome entrenched behavioristic resistance, is now all but dominant. There is no need, therefore, to recount in detail the concepts of appraisal and coping, which have now become part of the routine vocabulary of researchers in the field of stress.

*Transaction* implies that stress is neither in the environmental input nor in the person, but reflects the conjunction of a person with certain motives and beliefs (personal agendas, as it were) with an environment whose characteristics pose harm, threats, or challenges depending on these person characteristics.

Transaction also implies *process*. The stress relationship is not static but is constantly changing as a result of the continual interplay between the person and the environment. For example, in problem-focused coping, the actual terms of the relationship are changed, which in turn affects the appraisal. In emotion-focused coping, what is attended to may be changed, or its meaning is changed as when the person denies or distances from the threat, which in turn also affects the appraisal. In effect, stress is a multivariate process involving inputs, outputs, and the mediating activities of appraisal and coping; there is constant feedback from ongoing events, based on changes in the person–environment relationship, how it is coped with and, therefore, appraised (see Folkman & Lazarus, in press).

This view has dramatic consequences and poses great difficulties for stress measurement. It abandons a simple input–output analysis and becomes a fluid systems analysis involving a host of variables that influence each other in time and across the changing contexts of adaptation. The best way for the reader to see this is to examine the system of interdependent variables and processes in Table 1, which is one version, and to ask the question of where and what stress is, in this kind of analysis, and how it might be measured.

Once stress is viewed as a complex, multivariate process, the search for a single satisfactory measure—“the” stress of the stress process—is doomed to failure. Instead, what must be done in a theory-driven approach is to develop a series of measures each of which captures an important facet of the stress process. Ideally, we would need measures of the key inputs into the process (e.g., life events, daily encounters), measures of antecedents such as the person-centered motivational patterns and belief systems that guide appraisal and coping, measures of the mediating appraisal and coping processes generated in stressful transactions, as well as response markers of the process itself, that is, the subjective, behavioral, and physiological evidence of emotion. Because my conceptualization of stress involves a complex, multivariate process, it is difficult to say where process markers begin and end.

With respect to antecedent variables such as those indicated in Table 1, we can develop scales for measuring goals

and goal hierarchies, as Novacek and I are now doing, for beliefs about self and world, and for the relevant environmental variables. To do this properly requires that we examine the stability of these variables over time and across situational contexts. Presumably, some will change from encounter to encounter, and others will operate as stable structures. None of these variables per se can be said to *be* stress, because stress has been defined as a continually changing relationship between person and environment.

With respect to the mediating processes of appraisal and coping, it makes little sense to speak of stress until the variables and processes in the system have produced a particular kind of appraisal. To say this more formally, *psychological stress, which results from the interplay of system variables and processes, depends on an appraisal by the person that the person–environment relationship at any given moment is one of harm, threat, or challenge*. Stress is a postappraisal state.

Notice, however, that because of changes in the objective and subjective terms of a stressful encounter, the processes of appraisal and coping will also change over time and across encounters. Because stress is a process, we must measure it in each distinct context repeatedly from moment to moment or encounter to encounter. In a systems analysis, the question we must ask is how we can capture the changing person–environment relationship. This is a very difficult problem. Remember that I am speaking of an ideal rather than a reality, because those adopting this theoretical framework have had to compromise with the ideal in one way or another to do research, though some compromises come closer to the ideal than others.

Stress as Input

Behaviorist epistemology emphasizes objective external conditions as stressors, events that we can be reasonably confident have actually occurred and are not merely in the eye of the beholder. The traditional assumption underlying life-events measurement, which illustrates the input approach, draws implicitly on the concepts of load, stress, and strain (cf. Hooke’s 17th-century model, as cited in Hinkle,

Table 1. Illustrative System Variables for the Stress and Emotion Process

| Causal Antecedent                        | Mediating Process                        | Immediate Effect             | Long-Term Effect         |
|------------------------------------------|------------------------------------------|------------------------------|--------------------------|
| Person Variables                         | Encounter 1 . . . 2 . . . 3 . . . n      |                              |                          |
| Values, Commitments, and Goals           | Within an encounter                      |                              |                          |
| General Beliefs, Such as:                | Time 1 . . . 2 . . . 3 . . . n           |                              |                          |
| Self-Esteem                              |                                          |                              |                          |
| Mastery                                  |                                          |                              |                          |
| Sense of Control                         | Primary Appraisal (Stakes)               | Affect                       | Psychological Well-Being |
| Interpersonal Trust                      |                                          |                              |                          |
| Existential Beliefs                      | Secondary Appraisal (Coping Options)     | Physiological Changes        | Somatic Health/Illness   |
| Environmental Variables                  | Coping (Including Use of Social Support) | Quality of Encounter Outcome | Social Functioning       |
| Demands                                  |                                          |                              |                          |
| Resources (e.g., Social Support Network) | Problem-Focused Forms                    |                              |                          |
| Constraints                              | Emotion-Focused Forms                    |                              |                          |
| Temporal Aspects                         |                                          |                              |                          |

Notes: Although not shown here, the model is recursive. Also, note parallelism between short-term and long-term effects.

1973) by means of which an engineer can identify the parameters for building a bridge that will not fall down as a result of deformations of the structure (strain) under the weight (load) of cars driving over it.

This engineering analysis underlies the Holmes and Rahe (1967) Schedule of Recent Experiences, which initiated the life-events approach to stress measurement and has dominated studies of stress and health for two decades. Various other versions of this scale have been produced. Though the original Holmes and Rahe scale, and most of its variations, depend on normative subjective judgments about the adaptational demands that are imposed by events such as death of a spouse or divorce, they are largely atheoretical input scales, which are based on a statistical-empirical consensus about the strength of these demands. The version by Sarason, Johnson, and Siegel (1978) is an exception to the dependency on normative judgments because of its individualized ratings, though it is still limited to major life changes.

Vossel (1987) proposed that, although they are based on a minimum of theory, two theoretical premises underly all life-events scales, namely, that life changes always require adaptational struggles (a theme derived from Selye's, 1956/1976, theory of physiological stress) and that degree of distress provides a basis for quantifying the impact of life events. Both premises have been used independently as guidelines for the construction of life-events scales (see also Vossel & Laux, 1980).

Mountains of research using life-events scales over the past 20 years have revealed only modest, though fairly dependable, relationships between life events and illness, the correlations falling roughly within the range of .2 and .3. This is high enough to convince researchers that stress may have causal significance in illness, but too low to have practical value.

There is no reason to challenge the basic idea that environmental conditions, which are treated a bit casually as inputs, can create stressful demands and threats. However, this idea alone is inadequate to power an adequate theory of the stress process. The problems connected with the use of life-events scales have been fully discussed (e.g., Lazarus & Folkman, 1984; Rabkin & Struening, 1976; Tausig, 1982; Thoits, 1983) and need only be touched on briefly here.

First, major life events are relatively rare, and somewhat inconsistently and inadequately represented in measurement scales for diverse collectivities such as children, adolescents, adults, and older persons, as well as persons with divergent sociodemographic and occupational characteristics. A solution has been to create special scales for different groups. Second, life-events scales focus only on changes in conditions of life; much stress, however, is connected with chronic or recurrent conditions, which my colleagues and I have termed *daily hassles* and sociologists have referred to as *troubling role relationships* (cf. Pearlin, 1980). Third, the contribution made by the person to life events tends to be ignored, as when job loss or divorce is the result of personal inadequacies and at least partly the result of a deliberate decision. Fourth, life events can have different significances for persons with divergent cognitive and motivational agendas and coping resources and styles.

These problems all stem from an approach to stress that involves a minimum of theory and, with some exceptions, mostly leaves out individual meanings and coping patterns. Even the exceptions involve only modest, after-the-fact

efforts to identify personal meanings, and these efforts help to explain only a very small proportion of the health-outcome variance. Life-events scales have been designed to reflect more or less "objective" occurrences that, on a normative basis, can be expected to be rather stressful for most people, but the method ignores individual differences, which are always substantial. Several procedures for taking mediating psychological processes into account have been developed. The most prominent of these is the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979; see also Zilberg, Weiss, & Horowitz, 1982). However, none of them has much improved the capacity of the resulting measurement strategy to predict the health-related consequences, which is a main reason for measuring stress in the first place.

The strategy of producing a simple score to summarize stress states, in contrast with one that is more individualized and contextual, is probably the most serious limitation of the life-event methodology, a position strongly argued, for example, by Brown and Harris (1978) and supported by their research on life events and depression in women. As Auerbach (1986) put it:

It seems clear . . . that, as with other stimuli, stressful events cannot be viewed in isolation, but need to be studied in their total context. Further, independent of dispositional traits, the way an event is construed, and its attendant elements, determine to a large extent how it is responded to. (p. 14)

Whether and how stress impairs health and well-being remains bogged down in many theoretical and methodological issues that apply over and above the particular psychometric and conceptual limitations of the life-events approach. For example, long-term health is very stable, which makes causal analysis of the role of stress extremely difficult (cf. Kasl, 1983). It is also affected by a host of nonstress factors such as genetic-constitutional differences and accidents. These problems, and others too, mean that the low correlation with health-related variables is not necessarily merely an artifact of psychometrics but may truly reflect a modest role of stress on health outcomes.

### Stress as Output

When stress is treated as a reaction to conditions of living, measurement is directed at the subjective or organismic state that results. The measurement scales for this are generally unidimensional, as in the Subjective Stress Scale (SSS) of Kerle and Bialek (1958; see also Berkun, Bialek, Kern, & Yagi, 1962) or the Perceived Stress Scale (PSS) of Cohen, Kamarck, and Mermelstein (1983). The more a person reports being subjectively disturbed, for example, the higher is the stress response score. Although both these scales are output centered, they employ very different psychometric approaches.

In the SSS, Berkun et al. (1962) created an equal-appearing-interval Thurstone scale of 15 adjectives. Endorsement of an adjective expressing how much stress was or is being experienced presupposes a stronger reaction than any of the preceding adjectives, but less than all subsequent ones. For example, "nervous," which has a scale value of 69 of a total scale value of 94, indicates more stress than "unsteady" with a scale value of 64 but less than "worried" with a scale value

of 74. Though psychometrically sophisticated, the scale is very simple to use, both for the subject and the researcher.

The PSS scale of Cohen et al. (1983) is more like a typical personality test with 14 statements, each describing different but overlapping ways of being stressed or unable to manage demands adequately. Each statement is rated on a 4-point frequency-of-occurrence scale, thereby yielding a score of how often stress has occurred in the past month. It too has the virtue of being brief and easy to administer and score.

Although output scales like these have their uses, they share several limitations. First, little or no attention is paid to the contents or sources of the stress reaction, or its mediating processes. Second, the resulting score is strictly unidimensional, that is, stress levels vary from high to low without distinctions being made among qualitatively different types of stress reaction, for example, threat as opposed to challenge. If scales of psychological and somatic symptoms are included in the stress-output category, as illustrated by the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), a new difficulty is added: What is being measured is not merely stress level but a kind of psychopathology, which could be confounded with the stress reaction.

Actually, coping is probably a hidden factor in all output scales, because stress is apt to be greater when coping is inept, and effective coping may prevent or mitigate stress reactions. The reader should not miss the implication that output scales measure the resultant of many environmental demands and mediating psychological processes, such as appraisal and coping. These mediators are explicitly dealt with in the systems theory I summarized earlier and in Table 1.

Biomedicine has usually defined stress in terms of bodily changes signifying that homeostasis has been disturbed by noxious conditions of living. This too is an output model, originated by Cannon (1939) with research on adrenal-medullary catecholamines and expanded by Selye (1956/1976) to adrenocortical steroids. The biomedical writings of Hinkle (1973), Wolff (1953), and others follow a similar line of thought. Aside from direct measurements of biochemical changes in the laboratory, or the illness symptoms they might cause, no standardized stress scales have emerged from this type of analysis. One should note that the bodily changes are not merely a simple strain reaction, but constitute a complex, orchestrated, and dynamic defensive pattern for dealing with biochemical disequilibria. They comprise a physiological analogue to coping processes at the psychological level of analysis.

### Theory-Driven Measurement Strategies

Only two measurement solutions have thus far been evolved to apply these metatheoretical issues to stress measurement. In one, appraisal and coping are assessed repeatedly as the person–environment relationship changes over slices of time and across different encounters. In most stressful encounters the passage of time is associated with changes in the transaction, sometimes very rapid ones. However, it is not clear how to identify the size of the units of time for the repeated assessments.

The critical factor in this must be *points of transition* in the transaction, that is, those at which the relationship has changed in consequence of an active, unfolding process. The

points of transition probably vary with the person, the type of stress, and changes in the environmental pattern. In grief, for example, the transition points take much time, the whole process often extending for months, years, or more, whereas in an emotional encounter with a loved one such as an argument, although what happens is also a product of an extended relationship history, the points of transition may change many times in rapid succession over a brief time period. This process rule also applies to the study of stress over the life course; here too, one needs to decide about establishing the temporal units for repeated measurement. There is little developmental theory to guide researchers and large individual differences are always the rule.

As I said earlier, the ideal way to go about stress measurement is to make repeated assessments of all the variables in the system. This requires a theoretical or empirical rationale for selecting the time points during a stressful encounter, or over an extended period, as well as the variables to assess. Psychological research has tended to focus on structure not on process, probably because of the difficulties inherent in a process approach. In structural analysis, we make a single assessment and assume that this is either representative of the person in that encounter, or is representative of that type of encounter. This is why we evaluate the test–retest reliability of our tests psychometrically; if tests are not reliable in this sense, we discard them, which is appropriate only if we are measuring stable *traits*.

To study processes, however, valid tests that are internally consistent rather than having high test–retest stability are needed to allow us to describe how psychological *states* change over time and across situations. It is also possible, and perhaps best, to infer traits from repeated assessment of states. As Laux and Weber (1987) put it, “Empirically derived coping trait conceptions have the advantage of being based on the evidence of cross-situational consistency of coping” (p. 204). Given the costs and difficulties of doing this, I have no illusions that a process-centered style of assessment will be adopted by many researchers, because it would require intraindividual research designs in addition to the interindividual ones that now dominate research.

Process research is common in other areas of social and biological science such as ethological and experimental studies of mother–child transactions, group processes, and the courses of various illnesses. However, its use has not been common in stress research, where it is clearly appropriate and even necessary. In the clinical research study of depression, for example, process research is needed to provide crucial information about how depression is precipitated, sustained, and terminated. The cognitive qualities that are said to be causal in depression tend to be studied only during depression rather than before, during, and after in the depression-prone person.

The second solution is a compromise in which appraised relationships are summarized with a measure that is presumed to be a main outcome of the stress process. To get around the flux in any adaptational encounter, the degree and content of appraised stress is *aggregated* over a given time period or across encounters. A subjective calculus is made by the research subject, which sums up what has happened during that time period. The person is asked to tell us how it is going in general, over a broad slice of time or a short period such as yesterday, and either for specific encounters or for many.

When we aggregate appraised stress over a large time period, or across many encounters or transitions in an encounter, we overlook temporal and contextual fluctuations in favor of a common theme or structure, which is presumed to be stable. The danger in this solution is that lumping a complex, changing person–environment relationship into a single unit of time may distort what is actually happening.

This potential for distortion was observed in a study by Folkman and Lazarus (1985) of emotion and coping during three stages of a college examination. The normative coping strategies employed by students were found to change drastically from stage to stage. For example, in the anticipatory phase, distancing was virtually absent, but strong efforts to obtain information were common. However, after the exam when the students could only await word about how they did, seeking information virtually disappeared in favor of distancing, which emerged as the most frequent coping strategy. Normative emotional states also changed in comparable ways.

And so we can see that aggregating what happened in these discrete stages of the stress process, as is usually done in research on examination stress, would have misled us about the coping strategies used, and would have obscured the functional connection between coping and the changing demands of the situation. Aggregation over time and across discrete encounters or encounter stages is always dangerous when we are dealing with a process, though most research has done this. On the other hand, aggregation is a useful and perhaps necessary compromise in some types of research, as illustrated by my research on daily hassles.

### The Hassles Scales

In the late 1970s, my associates and I attempted to develop a measure of stress in daily living that was more relational and process centered than other measures. I believed then, as I do now, that to obtain markers of the stress process, at least three kinds of data are a necessity:

1. The content of daily stressful encounters, as appraised by the individual.
2. The subjective intensity of each stressful reaction.
3. The fluctuations in content and intensity of stress reactions over time.

The original Hassles Scale consisted of 117 items with diverse contents, which we thought of as the relational sources of stress. Research participants indicated whether each source of stress had occurred in a given time period, say, a month, a week, yesterday. In addition, they were asked to indicate how severe each stressful experience was on a 3-point scale. Separate aggregations of the hassles endorsed were obtained for frequency and intensity. This procedure, like life-events scales, sacrifices important data such as the details of each stressful encounter, information about its progression through stages, the appraisal and coping process and the variables contributing to it, and the total context of stress in the person's life. The Hassles Scale is, therefore, a major compromise with the theory and metatheory that spawned it. However, it does provide data about interindividual variation in appraised stress, and it is designed for repeated (intraindividual) assessments of changes over time in the degree and content of stress as appraised by persons.

In several field studies we demonstrated stronger *cross-sectional* relationships between hassles scores, psychological symptoms, and somatic health status than were found for a life-events scale (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer, & Lazarus, 1981). We also published some theoretical accounts of the rationale for the approach (Lazarus, 1984; Lazarus, DeLongis, Folkman, & Gruen, 1985).

A shorter, combined Hassles and Uplifts Scale (53 items) was developed later (DeLongis, Folkman, & Lazarus, 1988). It was based partly on an effort to combine hassles and uplifts, which had originally been assessed by separate scales, within the same format, and partly on a debate with B. S. Dohrenwend, B. P. Dohrenwend, Dodson, and Shrout (1984; see also B. P. Dohrenwend & Shrout, 1985) about the subjective-objective issue in stress measurement and the problem of confounding, both of which I discuss later.

The new scale items consist of single words or phrases reflecting some arena of stress such as “your child(ren),” “your spouse,” “fellow workers,” “your health,” and so on. The frequency score of this scale, like life-events scales, might be thought of as providing information about inputs, whereas the severity scale provides information about the stress reaction itself (cf. Reich, Parrella, & Filstead, 1988). In some of our own unpublished data obtained on 64 Berkeley students, the new frequency scale correlated .43 with the original, and, for severity, the correlation between the two scales was .54. And with a large sample of 448 working people, Young (1989) reported a correlation of .60 for frequency.

The combined Hassles and Uplifts Scale was then used in a *prospective* study of the covariation of daily stress, illness symptoms, and mood over 4 months in the same persons using an intraindividual research strategy. We were able to demonstrate a causal influence of hassles on illness symptoms and mood, as well as great individual differences in the degree and direction of the relationship (DeLongis et al., 1988). There have been numerous replications and extensions of our initial cross-sectional and prospective findings, many of which are cited in the manual for the Hassles and Uplifts Scale (Lazarus & Folkman, 1989).

### Issues of Stress Measurement

In this section, I use some of our work on daily hassles as a way of defining and confronting several important measurement issues. My interest centers on the overall strategy of stress measurement and its relation to theory, rather than on psychometrics. Four issues are addressed: (a) stress as an objective or subjective phenomenon, (b) stress as major cataclysms or seemingly minor annoyances, (c) the confounding of stress measures with adaptational outcomes, and (d) the contents of stress.

#### Stress as Objective or Subjective Phenomenon

This epistemological issue divides social scientists into those who define stress either as actual environmental demands or subjective appraisals of a relational misfit between demands and resources. The latter meaning of stress is, of course, inherent in the theory I summarized earlier.

I have never claimed that appraisals are idiosyncratic, though they can be. On the contrary, the task of appraisal is to

reconcile two sets of factors, the personal agendas (e.g., goal commitments, beliefs about self and world) characterizing each of us as individuals, *and* the objective conditions creating jeopardy for these agendas in any given individual. We could not survive if our appraisals did not take the real world into account, and we would lose our individual identity if our appraisals did not take personal agendas into account.

How well appraisals match reality is an issue separate from the theoretical and practical importance of appraisals in our emotional lives. It is quite appropriate, and for some purposes very useful, to attempt to identify actual environmental demands as well as how these are appraised by individuals. Putting aside for a moment how well we can do in the measurement of the objective environment, and how relevant consensual criteria of this are, the main value of having both an objective and a subjective measure of environmental input is to evaluate how well an individual constructs his or her reality, and in what ways the appraisals deviate from the objective world as defined consensually. There is solid evidence that (proximal) subjective appraisals are better predictors of emotional reactions than (distal) objective measures (cf. Repetti, 1987; Solomon, Mikulincer, & Hobfoll, 1987).

Life-events scales are often said to do a better job of identifying events that have actually occurred than scales built on subjective appraisals, which are more apt to be distorted by retrospective falsification and personal constructions. When people are asked to identify the daily hassles of the past day or week, what is endorsed are experiences that stand out in their mind as troublesome. Regardless of whether the items are cast objectively or subjectively, the longer the time gap from an occurrence to its reporting, the more room there is for personalized appraisals that deviate from what actually happened. No existing measures, however, are totally free from subjective process. Nevertheless, because stress is a postappraisal concept, in my judgment, this is not a handicap.

Yet purists keep criticizing subjective measures and arguing in favor of objective measurement. There is considerable hubris in this because no well-established, absolutely objective measurement scales have been developed and, in fact, the task may be impossible. Given the complexity of the environment and the fact that people can only attend to and assimilate modest portions of it, we should not be surprised that the psychological contents of the environment for one individual or collectivity are not the same as the contents for others. Even those devoted to the systematic description of the behavioral environment, such as Barker and Wright (1951) produce descriptions that are bogged down in detail and difficult at best to apply in stress research.

We might do better by describing relevant environments and their psychological meanings through the lenses of individuals or collectivities, and then try to verify these selective descriptions and interpretations by some consensual means. However, if used literally to describe actual events, this approach might still founder on the difficult issue—most often begged in research—of “how real is real” and on the distinction between objects as physical entities and their psychological meaning (Watzlawick, 1976). For example, the physical reality of gold is known and easily verified, but the psychological significance of gold varies from time to time and person to person, and depends much more on cultural symbols and economic arrangements forged arbitrarily by agreement. Stress and emotion, too, depend much more on the

inferential meanings about what happens than on what actually happens.

If we define stress in terms of appraisal, which refers to the personal meaning of encounters, we do not need to be uneasy about subjectivism. Quite the contrary, this is precisely what we want to know. Moreover, to adequately contrast the subjective and objective, we would need to have separate scales of each, a strategy that has rarely been tried. Despite claims to the contrary, satisfactory objective measures, uncontaminated by selective attention, perception, and interpretation, are exceedingly difficult, if not impossible, to create. I challenge those who are always inveighing against subjectivism to do themselves what they urge others to do, and to demonstrate that they are employing objective measures that tell us more about the stress process than subjective ones.

### **Stress as Major Cataclysms or Seemingly Minor Annoyances**

It is often said that when events are major or cataclysmic, and when its victims suffer the same harms, there will be less individual variation in distress reactions, psychological symptoms, and social as well as somatic dysfunction. This has been argued forcefully by Green (1986) on the basis of interview-derived observations of 381 persons who were victims of an environmental disaster, a flood at Buffalo Creek in 1972 (Gleser, Green, & Winget, 1978, 1981). Two years after the disaster, the survivors were still experiencing substantial dysfunction and distress, which appeared to depend more on the realities of their losses than on subjective appraisals.

I am not convinced that severe stressors abrogate or make individual differences negligible. Under such conditions a greater proportion of persons will probably share strong stress reactions, but the stress process includes much more than mere intensity and degree of dysfunction. Because of diverse personal agendas—over and above the most basic survival concerns—stress appraisals will also vary widely, as will the coping process and the psychological symptoms experienced. The more attention that is given to the rich panoply of human concerns in the stress process, including the contents of stress and the patterns of emotion and coping, the more room there will be for ubiquitous individual differences (see also Auerbach, 1986, for a similar analysis).

In any case, the events studied by Green and other disaster researchers, and those represented in life-events lists, are not very frequent in most people's lives, yet stress is ubiquitous. A viable theory of stress and its measurement cannot be created out of major life changes alone, and without taking into account appraisal and coping processes (cf. Lazarus & Folkman, 1986). The Hassles Scales were predicated on the view that the impact of major changes lies in what they do to the daily patterns of stress and coping and that much stress is predicated not on change but rather on daily demands, resources, and constraints operating in chronic or recurrent person–environment relationships.

On the basis of data from a prospective study with 58 older adolescents, Wagner, Compas, and Howell (1988) supported this thesis about the respective roles of life events and daily hassles in psychological symptoms:

It is probable that some major events are so powerful as to have a direct and independent effect on psycho-

logical distress. Yet, the effects of such events are often short lived and are not likely to be identified through existing methodologies for the study of psychosocial stress. For example, the death of a loved one results in a significant acute grief reaction in most individuals. However, acute grief reactions may last only a matter of days or weeks. Long-lasting effects on psychological well-being are likely to result from the loss. The typical method of assessing major and/or daily events that have occurred over a period of several months or longer is not sensitive to the short-term effects of major events. It should also be noted that although major events represent one cause of daily stressful events, they most certainly are not the only cause of daily stressors. Disruptions of daily routines, chronic strains associated with social roles, and enduring characteristics of the environment are also likely to contribute significantly to the occurrence of daily stress. (p. 202)

Wagner et al. used a LISREL causal modeling program within a prospective research design and obtained several findings that favor a cognitive-relational theory of the stress process. First, a causal path between major life events and symptoms could not be found independent of daily events (hassles), as is implied in the quote. Second, even when possible confounding was removed, daily hassles were strongly associated with psychological symptoms, more so than major events. This is relevant to the discussion of confounding in the next section. Third, with an approach that emphasized subjective appraisals in stress measurement, daily stresses functioned as both a dependent and an independent variable, as is explicit in Table 1, which presents a recursive or reciprocal systems analysis.

Almost no research attention has been given to the psychological mechanisms by which daily hassles produce dysfunction and several hypotheses are possible including, for example, simple *additive* models in which one can speak of cumulations of stress or of thresholds beyond which a person's limits are exceeded. Life-events research assumes that the stresses of change are additive or cumulative.

I have proposed an alternative *interactive* model, however, in which some hassles are said to be more important than others in producing dysfunction, and that individuals vary in their patterns of vulnerability (Lazarus, 1984). This alternative rests on the working assumption that, depending on personal agendas and coping ineptitudes, a given type of hassle may be of little importance for one person but of major importance for another. Paradoxically, when they occur, hassles that are not of central importance to the person may produce brief reactions that are as intense as centrally important ones; at the time of their occurrence, they take on great but short-lived importance, as in the case of being stuck in a traffic jam and being prevented from an important meeting, but this kind of encounter need not have long-term psychological significance.

I have used the term *central* for deeply important hassles and *peripheral* for deeply unimportant ones. My concept of centrality, or personal importance, overlaps with accessibility and conviction, and a host of other terms used in the social psychology of attitude (cf. Abelson, 1988). Abelson's analysis points up that little attention has been given to important psychological concepts like centrality, which imply that "some pigs are more equal than others" in George Orwell's famous metaphor.

There are two possible reasons for hypothesizing a more powerful role of central hassles, even though peripheral hassles can produce short-lived reactions that are just as intense: First, the sources of stress to which a person is particularly vulnerable are apt to recur frequently; and second, the distress and dysfunction produced by these sources do not end when the encounter has ended, yet the person continues to struggle to master the unresolved and recurring problems (cf. Horowitz, 1976), often for a considerable time after the traumatic encounter. Because central hassles persist long after they should have ended and because they keep recurring in the person's life, they are particularly prone to result in psychophysiological distress and dysfunction. In a recent study (Gruen, Folkman, & Lazarus, 1989), my colleagues have adumbrated this theme and provided some supportive data.

An important problem of stress measurement is to differentiate between the sources of stress that are major (central) and minor (peripheral) in different persons, which is another way of speaking about individual differences in vulnerability and the factors responsible for them. This may offer a more promising, behavioral method of indicating personal vulnerabilities, which may be superior to using conventional trait assessments such as inventories or neuroticism. In other words, we should be making as much effort measuring *seemingly* minor stress as major ones because some of these are of central importance in an individual's psychological economy. Although there will always be a general consensus about what are major and minor stresses, as Holmes and Rahe (1967) showed, this consensus obscures the distinctive patterns of vulnerability within and between individuals.

### Confounding of Stress Measures With Adaptational Outcomes

If one takes the position, as I have, that stress is always a product of appraisal, then some confounding between measures of stress and illness is inevitable. It is inevitable because the independent variable, appraised stress, is bound to contain a subjective sense of harm, threat, or challenge, which, in turn, overlaps with the dependent variable of feelings of distress and self-reports of dysfunction.

This generalization also applies to measures of somatic health. Because all measures of somatic health are dependent on self-reports, for the good reason that laboratory evidence alone is not considered to be an adequate medical criterion of illness in the absence of patient complaints, the problem of confounding cannot be completely overcome even in the case of somatic illness. It can, however, be measured and controlled to some extent so that complete and, therefore, fatal overlap between the antecedent and consequent measures does not occur.

This is, of course, a controversial position as was evident in the exchange with B. S. Dohrenwend et al. (1984; see also B. P. Dohrenwend & Shrout, 1985; Lazarus et al., 1985). There is no need here to restate the details of that controversy, except to emphasize that no existing approach, including life-events scales, is totally free of confounding. Confounding is clearly a complex and difficult problem, which several writers have recently addressed with positions at variance with what I have been saying (e.g., Kasl, 1983; Leventhal & Tomarken, 1987; Schroeder & Costa, 1984). It is interesting to me that, although these writers inveigh against confounding, which is easy to do, none has provided a means of

solving the problem without returning to the shibboleth of objective environmental inputs.

As my colleagues and I said in these debates, there is no way to separate person and environment in the appraised person–environment relationship without destroying what is meant by psychological stress as conceived in a cognitive-relational theory. Even if a totally objective input or output measure of stress were possible, it would, perforce, mean an abandonment of a cognitive-relational conceptualization and, therefore, would describe a totally different phenomenon. We would be distorting nature to fit a simpler, mythical metatheory of separable antecedent and consequent variables.

Furthermore, research evidence is constantly being obtained—but ignored—that whether the original Hassles Scale items are phrased in subjective or objective terms makes little or no difference in the relationship between stress and health or well-being (see, e.g., Lazarus et al., 1985). This is the case, I believe, because respondents add their own subjective interpretations in their endorsements of hassles items even when these items are objectively phrased.

In an impressive, prospective study by Rowlison and Felner (1988), a large sample of 682 students in Grades 7 to 12 was used in a multitrait–multimethod approach to life events and daily hassles as factors in adjustment. Daily hassles were better predictors of life adjustment on both self-report data and ratings of physical and emotional symptoms than were negative life events. Self-report indices of adjustment did show a higher relationship with daily hassles than teachers' ratings of adjustment did. However, the correlation between hassles and adjustment was not explainable solely by confounding because it was also highly significant for adjustment measures that were independent of self-report. Rowlison and Felner, in accord with my stated views, also concluded that proximal measures of stress, such as subjectively appraised hassles, are superior to distal measures such as so-called objective life events and provide a necessary supplement to life event measures of stress.

### Contents of Stress

The Hassles Scales were designed not only to produce an aggregated measure of stress level or intensity, but also to identify stress contents or sources. It is not enough to know merely that some people suffer greatly from stress whereas others experience relatively little. This would be a throwback to an outdated concept of general arousal or activation. The kinds of stress, or their sources in troubled person–environment relationships, must also be identified. Although a very strong general factor operates across the content areas, a factor analysis of the original Hassles Scales produced eight reliable types of content, namely, Future Security, Time Pressures, Work, Household, Health, Inner Concerns, Financial Responsibility, and Environment. A not dissimilar set of factors emerged from the combined Hassles and Uplifts Scale (see DeLongis et al., 1988; Lazarus & Folkman, 1989).

These separable contents or sources of stress are important because their patterns differ greatly among individuals and collectivities. These individual differences provide valuable sociodemographic information about the stress process

(Lazarus, 1984). For example, compared with younger persons, those who are older and retired show low levels of work and family stress and high levels of health-related stress, which is not surprising in the light of their ages and life patterns. These group variations illustrate the fruitfulness of sociodemographic studies of populations, settings, and cultures, as well as studies of individual variations that could have clinical diagnostic value. Males and females also differ in the contents of their stress, which reveal different patterns of activity and commitment that are presumably related to gender socialization (cf. Kanner, Feldman, Weinberger, & Ford, 1987).

### Where More Research Is Needed

Without expressing concern about whether it is stress or emotion that we should really want to measure (an issue I take up in the final section of this article), there are several limitations to the Hassles Scales as an approach to stress measurement that I want to summarize here. These include (a) the sociological versus psychological content of the scale, (b) the adaptational context of stress and coping, (c) the psychological significance of frequency and severity scores, (d) the time periods used to sample stress, and (e) the problem of realizing the multivariate, systems-theory perspective.

### Sociological Versus Psychological Content of the Hassles Scales

I have not been satisfied with the heavily sociological emphasis of the Hassles Scales and their content factors. I am convinced that a more psychological approach to stress content is needed because knowing that work stress, say, is high in some persons compared with others leaves us uninformed about the psychological processes that are involved. For example, in some persons the source of work stress may be based on an inordinate need to be liked or the inability to give and accept criticism, whereas in others it may have to do with “neurotic” vulnerability to being evaluated and perhaps found inadequate.

I hope researchers will create new hassle scales constructed entirely around relational psychological issues, which could be used to “diagnose” what is going wrong in the person–environment relationships of particular individuals and collectivities. A psychologically centered scale, one that revealed vulnerability to the thwarting or threatening of divergent personal commitments, would provide valuable information to be used in stress management. In addition, more systematic study of appraisal offers opportunities to explore in detail the psychological properties of the stress process. For example, one can make a careful examination of what was at stake in each stressful encounter (primary appraisal), how the person thought the encounter could be managed (secondary appraisal), and the personal and social constraints against particular forms of coping, including conflicts with other motives. This is an approach with which the Berkeley Stress and Coping Project has long been identified and on which we have made a start, although much still remains to be accomplished.

## Adaptational Context of Stress and Coping

One dilemma resulting from the use of a single scale to assess level and content of stress in individuals or collectivities over any time frame is that this strategy divorces stress from the total context of any individual person's adaptational pattern. The quote from Auerbach (1986, p. 14) I cited earlier, that it is counterproductive to view stressful encounters in isolation from the total context of stress in a person's life or in a given period of life, makes the same point and is also Brown and Harris's (1978) most telling criticism of life-events measures. If we provide three summary scores—frequency, severity, and content—to represent stress in any individual or collectivity, we disconnect stress from everything else that is important to the person. Although this kind of measure has its uses, we must not forget that it helps us lose sight of the individual as a complex, organized being with goal commitments and beliefs about self and world, integrated into a coherent, functional personality system (Lazarus, 1989b).

Essentially the same point can be made about coping. Daily hassles constitute stressful encounters a person must cope with. In the case of central hassles, coping may involve a very different kind of process than in peripheral hassles. Much of importance would be learned if an investigator or a clinician selected certain hassles (e.g., those that recur or those that are subjectively perceived as being central or having the highest emotional cost) to use in studying the coping process comparatively.

In short, it is artificial to measure stress independent of coping. Where there is stress, there is also coping as an integral feature of the adaptational encounter, whether the coping process is effective or ineffective, problem focused or emotion focused, or whether it is representative of the person (in the sense of a coping style) or a contextual response. The availability of a convenient measure of daily life stress should not seduce us into believing that we have covered the territory that must be considered to obtain a full understanding of the individual dynamics of stress, coping, and adaptational outcomes.

## Psychological Significance of Frequency and Severity Scores

In our earliest use of the Hassles Scale, we found that frequency of hassles was highly stable over time, suggesting that hassles frequency acted much like a trait, which could reflect either personality variables or a stable life context, or both. Unfortunately, we did not determine to what extent variation in the contents of stress occurred over time even though the total frequency scores did not show much change. How much stability there is in overall stress, and in its content, remains an important issue for stress measurement.

On the other hand, we found that severity scores were far more variable from month to month than frequency scores. The independence among these two facets of daily stress, frequency and intensity, was the basis for an effort by Reich et al. (1988) to evaluate a hypothesis that each of these facets of the stress reaction constituted a different kind of variable: Intensity was hypothesized to reflect a subjective and perhaps neurotic process of stress appraisal, and frequency was hypothesized to reflect the actual (objective) stresses of daily

living. Although they confirmed this hypothesis, their interpretation requires further study.

## Time Periods Used to Sample Stress

Because our research has involved compromises with the requirements of a process approach, we need to improve our understanding of how to study the stress process in the same person again and again over slices of time. The original Hassles Scale was first used in repeated-measurement research designs, with stress being sampled once a month. The size of the time period for sampling stress remains a difficult theoretical and practical issue, and I must concede that there is no way to resolve it in the abstract.

The dilemma applies to any measurement that is intraindividual and process centered, and its solution depends on the questions being asked, for example, whether one wishes to examine short-term or long-term consequences of stress and coping. When stress and emotion show rapid fluctuation over time, a good case can be made that a microanalytic strategy is especially desirable. On the other hand, when long-term health outcomes are being predicted, there is a good practical reason for aggregating minor changes by sampling stress over relatively long stretches of time. For long-term adaptational outcomes one needs to obtain an estimate of stress, and of coping, that is stable and characteristic of the person over time. A single sampling will never do, because it forces one to assume what is not in evidence and unlikely to be true, namely, that any given stressful encounter is representative for that individual's life situation.

## Problem of Realizing the Multivariate, Systems-Theory Perspective

It should be obvious that even a heavily revised Hassles Scale, which would reflect individual vulnerability and the psychodynamics of the stress process better than the present scales, must fall short of the mark if we do not also measure the many variables contributing to the stress process. There is no suitable shortcut for this because, as I have said, stress is postappraisal and not to be found in any single place in the system. Each variable is capable of affecting each other variable in what has been referred to as *reciprocal determinism* (cf. Bandura, 1978) or recursiveness.

To emphasize one or another of the important variables I have been discussing as *the* stress of the stress process is to seek a quick measurement fix that is bound to fall short of the ultimate objective of studying the stress process as a system of interdependent variables. Programmatic research is needed to pin down the important variables and to show how they operate. Relying on one input variable, a mediating process variable, or an output variable may satisfy the practical need to publish research, but may mislead us in the long run or contribute only a modest gain in understanding.

Nevertheless, the appropriateness of any given measure will depend on the research or clinical purpose to which it is applied. A practicing clinician might want to use situational and dispositional measures in combination to assess, for any given client, the environments that are especially stressful and to understand what makes them so. Treatment could involve, as it often does, trying to neutralize those situations or to avoid them when possible. Or, it can be directed at

attempts to change dysfunctional coping processes that contribute to excessive distress. These clinical strategies, which are in common use, depend on the ability to identify for any client what has gone wrong in the stress process, in effect, which variables are responsible for the dysfunction (see Lazarus, 1989a, for an elaboration of this theme in the context of treatment).

### Stress Versus Emotion

Finally, I want to underscore the most important limitation of stress measurement, namely, its unidimensional character, which is only modestly mitigated if we try to distinguish several types of stress such as harm, threat, and challenge, or eustress and distress (Selye, 1974). Stress is a part of a much broader and richer rubric, emotion. Although I have made a reputation in the field of stress, and at the risk of undermining an extended personal investment, I propose that we would be wiser to move away from stress toward the measurement of emotion.

In my opinion, social scientists have remained concerned with an inadequate conceptualization and measurement of stress because of an outmoded input–output epistemology, and a preoccupation—begun decades ago with behaviorism and operationism—which generated an ideological distrust of phenomenology and mediating processes. If one adopts a cognitive-relational perspective on stress, it is then only a small step to a cognitive-relational theory of emotion and to the task of measurement of the emotion process.

A cognitive-relational theory of stress that is transactional and process centered inevitably draws one toward the larger rubric of emotion because it includes the positive emotions, such as love and happiness-joy, and some such as relief and contentment whose status as emotions is more problematic, as well as stress-induced emotions such as anger, fear, anxiety, guilt, shame, envy-jealousy, sadness, and disgust.

Knowing, for example, that a person reacts to an adaptational encounter, or to a stable relationship with the world, say, with anger as opposed to anxiety, guilt as opposed to shame, envy as opposed to jealousy, or depression as opposed to euphoria, provides far more valuable information about how a person is relating to the environment (appraisal) and coping with harms and benefits, compared with knowing only about degree of stress. A cognitive-relational theory of emotion should make it possible to infer the cognitive, motivational, and coping processes underlying each emotion, and the harms and benefits that are implied by the particular emotion being experienced (cf. Lazarus & Smith, 1988; Smith & Lazarus, in press).

From the standpoint of a cognitive-relational theory, an emotional reaction, whether it be anger, anxiety, shame, guilt, envy, jealousy, joy, pride, compassion, love, and so forth, tells us—as it does in the case of stress—that an important value or goal has been engaged and is either harmed, at risk, or advanced in the transaction. In addition, an emotional reaction can tell us much about what a person has at stake in the encounter or in life in general, how that person interprets self and world, and how harms, threats, challenges, and benefits are coped with. If it is a recurrent emotion, then we learn these things about the emotional life from the vantage point of a personality trait; in effect, the business of recurrent emotional encounters is to some extent a property of the person as well as of the situation that is

encountered, because a trait to some extent transcends situations (see Lazarus, 1989a, for a discussion of emotion as a personality trait). I can think of no other concept in psychology that is as richly revealing of the way an individual relates to the physical and social environment, and to life itself, as the emotions, if we attend to them properly.

For this reason, research on how emotions affect health outcomes can tell us much more than research on stress and health outcomes. We need to know, for example, whether and in what ways specific negative emotions, such as anger and anxiety, contribute to illness and ill-being, and whether and in what ways specific positive emotions, such as love and happiness, contribute to health and well-being.

Some approaches to the measurement of emotion remain unsatisfactory, however, from my point of view because they are as unidimensional as the stress output scales I mentioned earlier. A case in point is the Positive and Negative Affect Scales designed by Watson, Clark, and Tellegen (1988). Although these scales contain, on the negative side, qualitatively different emotion items such as feeling afraid, ashamed, guilty, and hostile, these different emotions are combined into a unidimensional measure of intensity or negative affect. Although there may be good reasons for using unidimensional scales, they do not offer the rich analytic possibilities that cognitive-relational theories of emotions engender.

I conclude, then, with the recommendation that, instead of measuring stress, researchers should measure emotion quality and intensity whenever possible, as well as the cognitive-relational sources of emotions that are experienced. Although many of the issues of stress measurement and emotion measurement overlap, there are also important differences. It is time to turn our attention fully to the study and measurement of the emotion process. How to do this, however, must be the subject of a different essay.

### Note

Richard S. Lazarus, Department of Psychology, University of California, Berkeley, CA 94720.

### References

- Abelson, R. P. (1988). Conviction. *American Psychologist*, 43, 267–275.
- Auerbach, S. M. (1986). Assumptions of crisis theory and a temporal model of crisis intervention. In S. M. Auerbach & A. L. Stolberg (Eds.), *Crisis intervention with children and families* (pp. 3–37). Washington, DC: Hemisphere.
- Bandura, A. (1978). The self-system in reciprocal determinism. *American Psychologist*, 33, 344–358.
- Barker, R. G., & Wright, H. F. (1951). *One boy's day: A specimen record of behavior*. New York: Harper.
- Berkun, M. M., Bialek, H. M., Kern, R. P., & Yagi, K. (1962). Experimental studies of psychological stress in man. *Psychological Monographs*, 76(15, Whole No. 534).
- Brown, G. W., & Harris, T. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York: Free Press.
- Cannon, W. B. (1939). *The wisdom of the body* (2nd ed.). New York: Norton.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385–396.
- DeLongis, A., Coyne, J. C., Dakof, G., Folkman, S., & Lazarus, R. S. (1982). Relationship of daily hassles, uplifts, and major life events to healthy status. *Health Psychology*, 1, 119–136.
- DeLongis, A., Folkman, S., & Lazarus, R. S. (1988). Hassles, health, and mood: Psychological and social resources as mediators. *Journal of Personality and Social Psychology*, 54, 486–495.
- Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi,

- L. (1974). The Hopkins Symptom Checklist (HSLC): A self-report symptom inventory. *Behavioral Science*, 19, 1–15.
- Dohrenwend, B. P., & ShROUT, P. E. (1985). "Hassles" in the conceptualization and measurement of life stress variables. *American Psychologist*, 40, 780–785.
- Dohrenwend, B. S., Dohrenwend, B. P., Dodson, M., & ShROUT, P. E. (1984). Symptoms, hassles, social supports and life events: The problem of confounded measures. *Journal of Abnormal Psychology*, 93, 222–230.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48, 150–170.
- Folkman, S., & Lazarus, R. S. (in press). Coping and emotion. In N. Stein, B. Leventhal, & T. Trabasso (Eds.), *Psychological and biological approaches to emotion*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc. (Appeared in *Social Science in Medicine*, 1988, 26, 309–317, under the title "The relationship between coping and emotion")
- Gleser, C. G., Green, B. L., & Winget, C. M. (1978). Quantifying interview data on psychic impairment of disaster survivors. *Journal of Nervous and Mental Disease*, 166, 209–216.
- Gleser, C. G., Green, B. L., & Winget, C. M. (1981). *Prolonged psychosocial effects of disaster: A study of Buffalo Creek*. New York: Academic.
- Green, B. L. (1986). On the confounding of "hassles" stress and outcome. *American Psychologist*, 41, 714–715.
- Gruen, R., Folkman, S., & Lazarus, R. S. (1989). Centrality and individual differences in the meaning of daily hassles. *Journal of Personality*, 56, 743–762.
- Hinkle, L. E., Jr. (1973). The concept of "stress" in the biological and social sciences. *Science, Medicine, & Man*, 1, 31–48.
- Holmes, T. H., & Rahe, R. H. (1967). The Social Readjustment Rating Scale. *Journal of Psychosomatic Research*, 11, 213–218.
- Horowitz, M. J. (1976). *Stress response syndromes*. New York: Aronson.
- Horowitz, M. J., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine*, 41, 209–218.
- Kanner, A. D., Coyne, J. C., Schaefer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, 4, 1–39.
- Kanner, A., Feldman, S. S., Weinberger, D. A., & Ford, M. E. (1987). Uplifts, hassles, and adaptational outcomes in early adolescents. *Journal of Early Adolescence*, 7, 371–394.
- Kasl, S. V. (1983). Pursuing the link between stressful life experiences and disease: A time for reappraisal. In C. L. Cooper (Ed.), *Stress research* (pp. 79–102). Chichester, England: Wiley.
- Kerle, R. H., & Bialek, H. M. (1958). *The construction, validation and application of a Subjective Stress Scale* (Staff memorandum). Monterey, CA: United States Army Leadership Human Resources Unit.
- Laux, L., & Weber, H. (1987). Person-centered coping research. *European Journal of Personality*, 1, 193–214.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lazarus, R. S. (1984). Puzzles in the study of daily hassles. *Journal of Behavioral Medicine*, 7, 375–389.
- Lazarus, R. S. (1989a). Cognition and emotion from the RET viewpoint. In M. E. Bernard & R. DiGiuseppe (Eds.), *Inside rational emotive therapy* (pp. 47–68). Orlando, FL: Academic.
- Lazarus, R. S. (1989b). Constructs of the mind in mental health and psychotherapy. In A. Freeman, K. M. Simon, L. E. Beutler, & H. Arkowitz (Eds.), *Comprehensive handbook of cognitive therapy* (pp. 99–121). New York: Plenum.
- Lazarus, R. S., DeLongis, A., Folkman, S., & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded measures. *American Psychologist*, 40, 770–779.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lazarus, R. S., & Folkman, S. (1986). Reply to Deutsch and Green. *American Psychologist*, 41, 715–716.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1, 141–169.
- Lazarus, R. S., & Folkman, S. (1989). *Manual for the study of daily hassles*. Palo Alto, CA: Consulting Psychologists Press.
- Lazarus, R. S., & Smith, C. (1988). Knowledge and appraisal in the cognition–emotion relationship. *Cognition and Emotion*, 2, 281–300.
- Leventhal, H., & Tomarken, A. (1987). Stress and illness: Perspectives from health psychology. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in research methodology*. Chichester, England: Wiley.
- Pearlin, L. I. (1980). The life cycle and life strains. In H. M. Blalock (Ed.), *Sociological theory and research: A critical approach*. New York: Free Press.
- Rabkin, J. G., & Struening, E. L. (1976). Life events, stress, and illness. *Science*, 194, 1013–1020.
- Reich, W. P., Parrella, D. P., & Filstead, W. J. (1988). Unconfounding the Hassles Scale: External sources versus internal responses to stress. *Journal of Behavioral Medicine*, 11, 239–249.
- Repetti, R. L. (1987). Individual and common components of the social environment at work and psychological well-being. *Journal of Personality and Social Psychology*, 52, 710–720.
- Rowlison, R. T., & Felner, R. D. (1988). Major life events, hassles, and adaptation in adolescence: Confounding in the conceptualization and measurement of life stress and adjustment revisited. *Journal of Personality and Social Psychology*, 55, 432–444.
- Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology*, 46, 932–946.
- Schroeder, D. H., & Costa, P. T. (1984). Influence of life events on physical illness: Substantive effects or methodological flaws? *Journal of Personality and Social Psychology*, 46, 853–863.
- Selye, H. (1974). *Stress without distress*. Philadelphia: Lippincott.
- Selye, H. (1976). *The stress of life*. New York: McGraw-Hill. (Original work published 1956)
- Smith, C., & Lazarus, R. S. (in press). Emotion and adaptation. In L. A. Pervin (Ed.), *Handbook of personality theory and research*. New York: Guilford.
- Solomon, Z., Mikulincer, M., & Hobfoll, S. E. (1987). Objective versus subjective measurement of stress and social support: Combat-related reactions. *Journal of Consulting and Clinical Psychology*, 55, 577–583.
- Tausig, M. (1982). Measuring life events. *Journal of Health and Social Behavior*, 23, 52–64.
- Thoits, P. (1983). Dimensions of life events that influence psychological distress: An evaluation and synthesis of the literature. In H. B. Kaplan (Ed.), *Psychosocial stress: Trends in theory and research* (pp. 33–103). New York: Academic.
- Vossell, G. (1987). Stress conceptions in life event research: Towards a person-centered perspective. *European Journal of Personality*, 1, 123–140.
- Vossell, G., & Laux, L. (1980). *Life stress approach and transactional stress theory*. Paper presented at the International Congress of Psychology, Leipzig.
- Wagner, B. M., Compas, B. E., & Howell, D. C. (1988). Daily and major life events: A test of an integrative model of psychosocial stress. *American Journal of Community Psychology*, 16, 189–205.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Watzlawick, P. (1976). *How real is real?* New York: Random House.
- Wolff, H. G. (1953). *Stress and disease*. Springfield, IL: Thomas.
- Young, V. C. (1989). *Hassles, uplifts, and life events as predictors of health* (Doctoral dissertation, University of California, Berkeley, 1987). *Dissertation Abstracts International*, 49(8).
- Zilberg, N. J., Weiss, D. S., & Horowitz, M. J. (1982). Impact of Event Scale: A cross-validation study and some empirical evidence supporting a conceptual model of stress response syndromes. *Journal of Consulting and Clinical Psychology*, 50, 407–414.